

## WHAT IS CLAIMED IS:

1. A method for dynamic allocation of transmission bandwidth resources, said method comprising the steps of:

receiving data from user services having predefined data service transmission rates;

defining a plurality of slots within the transmission bandwidth resources, each of said slots representing a channel having a predefined data channel transmission rate;

dynamically allocating said slots to user services based on said data service transmission rates and said data channel transmission rates; and

transmitting data received from said user services in said slots according to said dynamic allocation step.

2. A method according to claim 1, further comprising the step of utilizing one of said slots to carry slot mapping information identifying allocation of said slots among said services.

3. A method according to claim 1, further comprising the step of transmitting as auxiliary header information, an allocation map defining a relationship between each service and one or more associated slots.

1 4. A method according to claim 1, wherein said  
2 defining step includes defining dynamically said  
3 channels with differing data channel transmission rates.

1 5. A method according to claim 1, wherein said  
2 defining step includes defining said channels with a  
3 fixed common data channel transmission rate.

1 6. A method according to claim 1, wherein said  
2 allocating step includes allocating at least a first  
3 service to a single first slot and at least a second  
4 service to at least second and third slots.

1 7. A method according to claim 1, wherein said  
2 allocating step allocates said slots sequentially.

1 8. A method according to claim 1, wherein said  
2 allocating step allocates said slots non-sequentially.

1 9. A method according to claim 1, wherein a first  
2 user service has a service transmission rate and is  
3 allocated first and second slots which separately have  
4 slot transmission rates of approximately one-half of  
5 said service transmission rate.

1 10. A method according to claim 1, further  
2 comprising the step of:

3           dividing data received from at least one of said  
4           user services into at least two bitstreams which are  
5           allocated to different slots; and

6           combining bitstreams from all user services into  
7           allocated slots of an aggregate bitstream, said dividing  
8           and combining steps being performed based on said  
9           dynamic allocation step.

1           11. A method according to claim 1, further  
2           comprising the step of maintaining a slot allocation  
3           table mapping a relation between services and slots.

1           12. A method according to claim 1, further  
2           comprising the step of updating and reallocating slots  
3           between services when a service transmission rate of at  
4           least one user service changes.

1           13. A multiple channel, multiple carrier  
2           transmission system for transmitting data from a  
3           plurality of user services over dynamically allocated  
4           transmission bandwidth resources, said system  
5           comprising:

6           a plurality of input channels for carrying data for  
7           user services at predefined service data rates;

8           a multiplexor for combining service data from said  
9           input channels into an aggregate bitstream comprising  
10          data slots, each of said slots representing an output

11 channel having a predefined data channel transmission  
12 rate;

13 a modulator for converting said aggregate bitstream  
14 into an RF signal; and

15 a slot allocator, communicating with said input  
16 channels, for dynamically allocating input channels and  
17 associated slots to said user services based on  
18 transmission rates of said user services and of said  
19 slots.

1 14. A system according to claim 1, wherein said  
2 slot allocation includes at least one switch for  
3 dividing data from at least one user service between at  
4 least two of said input channels.

1 15. A system according to claim 13, wherein said  
2 slot allocator generates a map defining a relation  
3 between user service and channels.

1 16. A system according to claim 13, further  
2 comprising a slot allocation table for storing a mapping  
3 relation between each user service and slots allocated  
4 thereto.

1 17. A system according to claim 13, further  
2 comprising a switch for dividing data from a first user  
3 service among multiple input channels, said slot

4 allocator connecting a second user service to a single  
5 input channel.

1 18. A system according to claim 13, wherein said  
2 slot allocator allocates said input channels  
3 sequentially to use services.

1 19. A system according to claim 13, wherein said  
2 slot allocation allocates said input channels non-  
3 sequentially to user services.

1 20. A system according to claim 13, wherein said  
2 slot allocation updates and reallocates slots between  
3 user services when a service transmission rate of at  
4 least one user service changes.

1 21. A system for digitally encoding and  
2 transmitting digital video signals and related digital  
3 audio signals, said system comprising:

4 at least one video encoder for receiving and  
5 encoding digital signals to provide encoded video  
6 bitstreams;

7 at least a first audio encoder for receiving and  
8 encoding at least one audio bitstream, said audio  
9 bitstream relating to said video bitstream;

10 a multiplexor for time division multiplexing said  
11 video bitstream and said audio bitstream received along

12 at least two separate input channels to produce an  
13 aggregate audio/video bitstream containing at least two  
14 channels of fixed band width; and

15 a modulator for transmitting said aggregate  
16 audio/video bitstream.

1 22. A system according to claim 21 wherein said  
2 audio and video encoders separately packetized each of  
3 said audio and video bitstreams in audio and video  
4 packets, which contain presentation time stamps with  
5 respect to differing audio and video reference times  
6 generated independent of the time division multiplexing  
7 operation, said multiplexor multiplexing said audio and  
8 video packets without changing said presentation time  
9 stamps.

1 23. A system according to claim 21, wherein said  
2 multiplexor outputs said video bitstream upon at least  
3 a first video channel and outputs first and second audio  
4 bitstreams upon at least first and second audio  
5 channels, said first video channel and said first and  
6 second audio channels being non-overlapping with and  
7 mutually exclusive from one another.

1 24. A system according to claim 21, wherein said  
2 modulator transmits said aggregate bitstream containing

3 all of said audio and video channels over a single  
4 carrier signal.

1           25. A system according to claim 21, wherein said  
2   modulator transmits said aggregate bitstream over  
3   multiple carrier signals.